University of Maine	**)**	**Departmental**
Penobscot County	**)**	**Findings of Fact and Order**
Orono, Maine	**)**	**Air Emission License**
A-204-70-D-A	**)**	**Amendment #3**

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A, Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Facility	University of Maine (UMaine)
License Number and Issued Amendments	A-204-70-A-I A-204-70-B-M A-204-70-C-A
Current Amendment Type	Minor Modification Part 70 Minor Change Part 70 Minor Revision
NAIC Code(s)	611310
Nature of Business	Educational Facility
Date of License Issuance	November 6, 2000
Date of License Expiration	November 6, 2005
Date of Minor Modification Issuance	May 22, 2003

This Minor Modification includes licensing the following:

* a 3.6 MMBtu/hr portable generator, and
* three new back-up electrical generators.

This license also incorporates a Part 70 Minor Change for the conversion to gas for the two boilers located in the Global Sciences building.

This license incorporates a Part 70 Minor Revision for the inclusion of a 2 MMBtu/hr backup generator at the Alfond Arena which was initially classified as an insignificant activity pursuant to Appendix B of Chapter 140 of the Department's regulation.

This license also deletes conditions pertaining to the Hitchner Hall incinerator, since it was removed from campus in December 2001.

B. Emission Equipment

The emission units addressed in this license are the following:

Equipment	Capacity (MMBtu/hr)	Fuel
New licensed units		
312 hp Back-up Generator at Alfond Arena	2.0	#2 fuel oil (<0.5% sulfur)
Portable Electric Generator	3.6	Diesel (<0.05% sulfur)
400 kW Back-up Generator at Hitchner Hall	4.1	Diesel (<0.05% sulfur)
300 kW Back-up Generator at Aubert Hall	3.2	Diesel (<0.05% sulfur)
300 kW Back-up Generator at Science and Engineering Research Center	3.2	Diesel (<0.05% sulfur)
Existing licensed units		
Existing Boiler at Global Sciences Building	4.4	Switching to natural gas from #2 fuel oil
Existing Boiler at Global Sciences Building	4.4	Switching to natural gas from #2 fuel oil

C. Application Classification

1. Part 70 Minor Modification
   The licensing of the portable generator and the three emergency generators is classified as a Minor Modification, based on emissions from the four units. A minor modification is a modification that results in less than a significant emissions increase of all regulated pollutants. The proposed emissions from the four units and the significant emissions increase thresholds are as follows:

Pollutant	Proposed License Emissions from the Four Generators (tpy)	Significant Emissions Increase Thresholds (tpy)
PM	0.42	25
PM_{10}	0.42	15
SO_2	0.17	40
NO_X	8.95	40
CO	2.91	100
VOC	0.14	40

2. Part 70 Minor Change
   The addition of natural gas to the two Global Science Building boilers is not a Part 70 Major Change or a 'modification'. The facility is not proposing substantial changes to existing monitoring and testing requirements, nor is it proposing the relaxation of existing license conditions (definition of Part 70 Major Change). The use of natural gas does not constitute a 'modification' because it does not result in the emission of a pollutant not previously emitted. The heat input capacity of the boiler will not increase. The facility's request to convert the two boilers to natural gas is classified as a Part 70 Minor Change.

3. Part 70 Minor Revision
   In September 2001, changes were made to Chapter 140 of the Department's regulations including the insignificant list. Section 15 of Chapter 140 of the Department's regulations states sources shall submit a minor revision to incorporate any units removed from the original list of insignificant activities. The current operation of the backup generator at the Alfond Arena is no longer considered an insignificant activity and is incorporated into this license as a minor revision.

II. MINOR MODIFICATION DESCRIPTION

A. Portable Electric Generator

The 3.6 MMBtu/hr portable electric generator at UMaine fires diesel fuel with a sulfur content no greater than 0.05% and is rated at 350 kW. The generator is used to provide backup electric power during power outages. It is also used to supply power during outdoor events where there are no power sources nearby.

A BACT analysis was submitted for this generator. The submittal addressed fuel type, operating practices, fuel injection timing retard, and add-on controls such as selective catalytic reduction (SCR) and an oxidation catalyst as potential options

for minimizing emissions. It was concluded that for a generator of this size and limited operational time, neither SCR and fuel injection timing retard would provide substantial environmental benefits. The controls could potentially result in additional emissions of ammonia from SCR and increased CO, PM and opacity from fuel injection timing retard. Oxidation catalysts have been used primarily on large prime power units to reduce CO and VOC, not on small portable generators.

BACT for the portable generator was determined to be an operational limit of 500 hours/year, good operation and maintenance practices, a fuel sulfur limit of 0.05%, and the following limits (based on manufacturer's data):

PM	0.12 lb/MMBtu per Chapter 103
SO_2	0.05% sulfur
NO_X	8.17 lb/hr
CO	1.87 lb/hr
VOC	0.10 lb/hr
Opacity	Not to exceed 20% on a 6 minute block average, except for no more than 2 six minute averages in a 3 hour period

B. Three Backup Generators

The three backup generators shall provide electrical power to sophisticated research equipment that could potentially be damaged if there is an interruption in the electrical power supply while the research equipment is in operation. The generators will be operated for testing purposes and for providing backup power. The 400 kW generator (4.1 MMBtu/hr) will be utilized for the equipment in Hitchner Hall and the 300kW generators (3.2 MMBtu/hr each) will be utilized for the equipment in Aubert Hall and the Science and Engineering Research Center.

UMaine submitted a BACT analysis for these generators, with information and results similar to the portable generator analysis described in the above section. Emissions were calculated based on manufacturers data.

BACT for each of the three emergency generators is an operational limit of 500 hours/year, good operation and maintenance practices, a fuel sulfur limit of 0.05%, and the following limits:

Pollutant	400kW generator	300 kW generators (each)
PM	0.12 lb/MMBtu per Chapter 103	0.12 lb/MMBtu per Chapter 103
SO_2	0.05% sulfur	0.05% sulfur fuel
NO_X	9.08 lb/hr	9.29 lb/hr
CO	4.16 lb/hr	2.80 lb/hr
VOC	0.10 lb/hr	0.16 lb/hr

Opacity from each generator shall not exceed 20% on a 6 minute block average, except for no more than 2 six minute averages in a 3 hour period.

Per Chapter 100 of the Department's regulations, the definition of emergency is the following:

> "… any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology based emission limitation under the license, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

III. PART 70 MINOR CHANGE DESCRIPTION

UMaine is licensed to operate two #2 fired oil boilers (4.4 MMBtu/hr) at the Global Sciences building. UMaine has proposed to convert the boilers to firing natural gas only.

The emission limits from firing natural gas in the two Global Science Building boilers were based on the current emission limits. The boilers are small and emission data was not available from the gas burner vendor so UMaine has proposed to keep the current hourly limits (based on #2 oil) for PM, NO_X, CO, and VOC. UMaine has proposed to remove the SO_2 limit since natural gas combustion is considered to have negligible SO_2 emissions and any emissions that are present are a function of the mercaptan content of the gas supply which is out of the control of UMaine.

The emission limits from firing natural gas in each of the two Global Science Building boilers shall be the following:

PM	0.12 lb/MMBtu
SO_2	Negligible
NO_X	1.6 lb/hr
CO	1.3 lb/hr
VOC	0.04 lb/hr

IV. PART 70 MINOR REVISION

UMaine has submitted a minor revision request to add the existing backup electric generator located at the Alfond Arena. The generator is 150 kW, burns #2 heating oil, and is powered by a John Deere model 6619A engine. Based on the 312 horsepower rating, it is estimated that the engine's heat capacity is approximately 2 MMBtu/hr.

The generator was classified as insignificant when the Initial Part 70 License was issued to UMaine. In September 2001, changes were made to Chapter 140 of the Department's regulations such that stationary internal combustion engines having a heat input capacity of less than 3 MMBtu/hr are only classified as insignificant if the sulfur content of the fuel is equal to or less than 0.05% by weight. Previously, Chapter 140, Appendix B stated that engines less than 3 MMBtu/hr were 'insignificant' if they burned distillated oil. The sulfur content was not specified.

The Alfond generator does not meet the current criteria of insignificant since the generator is supplied by the fuel from the oil storage tank that also serves the Alfond heating boiler. The oil supply in the tank is conventional heating oil, with a maximum sulfur content of 0.5%. Providing a separate fuel supply for the generator in order to provide the unit with low sulfur diesel fuel would present cost and space issues and would provide little environmental benefit. UMaine has proposed to maintain the present fuel supply configuration and submitted this minor revision request as required by Section 15 of Chapter 140.

Emissions from the Alfond Arena emergency generator, which shall have a 500 hour/year operating restriction, were based on EPA emission factors (Table 3.3-1) and calculated to be the following:

Pollutant	**Emission Limit**
PM	0.62 lb/hr
SO_2	#2 oil, 0.5% sulfur
NO_X	8.82 lb/hr
CO	1.9 lb/hr
VOC	0.72 lb/hr
Opacity	Not to exceed 20% on a 6 minute block average, except for no more than 2 six minute averages in a 3 hour period

V. Facility Annual Emissions

The following table includes annual emissions from the licensed emission units:

Total Allowable Licensed Annual Emissions (tons/year)
(used to calculate the annual license fee)

Equipment	PM	PM_{10}	SO_2	NO_X	CO	VOC
Boilers 3, 4, 5, 6, and 7	52.5	52.5	551.3	144.4	157.5	26.25
Service Bldg Boiler	4.2	4.2	10.7	7.5	12.9	2.1
Global Science Ctr Boilers (two)	4.6	4.6	0	14.0	11.4	0.35
Hitchner Hall Generator	0.12	0.12	0.05	2.27	1.04	0.03
Aubert Hall Generator	0.1	0.1	0.04	2.32	0.7	0.04
Science and Engineering Ctr Generator	0.1	0.1	0.04	2.32	0.7	0.04
Portable Electric Generator	0.1	0.1	0.04	2.04	0.47	0.03
Alfond Generator	0.16	0.16	0.25	2.21	0.48	0.18
Printing Services						2.0
TOTALS	**62**	**62**	**562**	**177**	**185**	**31**

ORDER

Based on the above Findings and subject to conditions listed below the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards, or increment standards either alone or in conjunction with emissions from other sources.

Therefore the Department grants this amendment A-204-70-D-A, subject to the conditions found in air emission license A-204-70-A-I, in the subsequent amendment A-204-70-B-M and A-204-70-C-A, in addition to the following conditions:

Condition (31) shall be deleted from air emission license A-204-70-A-I (pertaining to the Hitchner Hall incinerator).

The following shall replace condition (27) in air emission license A-204-70-A-I:

(27) Global Science Center Boilers #1 and #2

A. The two 4.4 MMBtu/hr Global Science Center Boilers shall fire only natural gas. [ME DEP, Chapter 140, BPT] **Enforceable by State-only**

B. Emissions from the Global Science Center boilers #1 and #2 shall each not exceed the following limits:

Pollutant	lb/MMBtu	Origin and Authority	Enforceability
PM	0.12	ME DEP, Chapter 103, Section 2(B)(1)(a)	-
PM_{10}	0.12	ME DEP, Chapter 140, BPT	Enforceable by State-only

Pollutant	Lb/hr	Origin and Authority	Enforceability
PM	0.53	ME DEP, Chapter 140, BPT	Enforceable by State-only
PM_{10}	0.53	ME DEP, Chapter 140, BPT	Enforceable by State-only
SO_2	Negl.*	ME DEP, Chapter 140, BPT	Enforceable by State-only
NO_X	1.6	ME DEP, Chapter 140, BPT	Enforceable by State-only
CO	1.3	ME DEP, Chapter 140, BPT	Enforceable by State-only
VOC	0.04	ME DEP, Chapter 140, BPT	Enforceable by State-only

C. Opacity

1. UMaine shall operate the science center boilers #1 and #2 each, such that the visible emissions do not exceed 20% opacity on a six (6) minute block average basis, except for no more than two (2) six (6) minute block averages in any 3-hour period. [ME DEP, Chapter 140, BPT] **Enforceable by State-only**
2. UMaine shall operate the science center boilers such that visible air contaminants emitted do not exceed an opacity of 40% for more than 20 minutes in any continuous 2-hour period or 80% for more than 10 minutes in any one hour. [ME DEP, Chapter 101]

The following shall replace condition (35) in air emission license A-204-70-A-I, as amended in air emission license A-204-70-C-A:

(35) Recordkeeping

For all recordkeeping required by this license, the licensee shall maintain records of the most current six year period. [ME DEP, Chapter 140]

A. The following records shall be maintained for boilers #3 - #7:
   1. Annual #6 fuel oil use indicating the quantity of fuel consumed (in gallons) based on delivery records and monthly tank inventories of fuel in and out of the single fuel oil storage tank (taken at the beginning and end of each month), the percent (%) sulfur content of the fuel by weight, and the nitrogen content of the fuel demonstrated by fuel analysis' from the supplier. Annual records shall be kept on a 12 month rolling total basis. [ME DEP, Chapter 138]
   2. Record of annual tune-ups to include the following: [ME DEP, Chapter 138]
      a. tune-up procedure file,
      b. an oxygen/carbon monoxide curve or an oxygen/smoke curve,
      c. verification of the optimum oxygen setting, and
      d. proof that the fuel and air mixing have been improved if the minimum oxygen level is found to be substantially higher than the value provided by the manufacturer.

B. UMaine shall maintain records of the quantity of natural gas burned in Boiler #7 and in each of the two Global Science Center boilers each calendar month and on a 12 month rolling total basis.

C. Annual #2 fuel oil use records indicating the quantity of fuel consumed campus wide (in gallons) based on purchase receipts, and the percent sulfur content of the fuel by weight demonstrated by fuel type. Annual records shall be kept on a monthly and 12 month rolling total basis.

D. Records of all chemical usage in the printing services department, to include the amount used, the VOC content and the percentage HAP for each of the chemicals on an annual basis.

E. Records of solvent added to the solvent degreaser. [ME DEP, Chapter 130]

F. UMaine shall maintain records of the monthly and annual throughput of gasoline at each dispensing station. [ME DEP, Chapter 118]

New Conditions:

(45) **Portable Electric Generator**

A. The portable 3.6 MMBtu/hr diesel generator shall be limited to 500 hours per year of operation, based on a 12 month rolling total. An hour meter shall be operated and maintained on the portable generator. [ME DEP, Chapter 140, BPT]

B. The diesel fuel shall not exceed a sulfur content of 0.05%. Fuel records shall be maintained including receipts from the supplier documenting sulfur content. [ME DEP, Chapter 140, BPT]

C. A log documenting the dates, times and reason of operation for the generator shall be kept. [ME DEP, Chapter 140, BPT]

D. Emissions from the portable generator shall not exceed the following [ME DEP, Chapter 140, BPT]:

Pollutant	lb/MMBtu	lb/hr
PM	0.12 [ME DEP, Chapter 103]	0.43
PM_{10}	---	0.43
SO_2	---	0.18
NOx	---	8.17
CO	---	1.87
VOC	---	0.10

E. Visible emissions from the portable generator shall not exceed 20% on a 6 minute block average, except for no more than 2 six minute averages in a 3 hour period. [ME DEP, Chapter 140, BPT]

(46) **Emergency Generators – Hitchner Hall, Aubert Hall, Science and Engineering Research Center**

A. The Hitchner Hall 4.1 MMBtu/hr emergency diesel generator, the Aubert Hall 3.2 MMBtu/hr emergency diesel generator, and the Science and Engineering Research Center 3.2 MMBtu/hr emergency diesel generator shall each be limited to 500 hours per year of operation, based on a 12 month rolling total. An hour meter shall be operated and maintained on each generator. [ME DEP, Chapter 140, BPT]

B. The diesel fuel fired in the emergency generators shall not exceed a sulfur content of 0.05%. Fuel records shall be maintained including receipts from the supplier documenting sulfur content. [ME DEP, Chapter 140, BPT]

C. A log documenting the dates, times and reason of operation for each emergency generator shall be kept. [ME DEP, Chapter 140, BPT]

D. Emissions from the emergency generators shall not exceed the following [ME DEP, Chapter 140, BPT]:

Pollutant	Hitchner Hall Generator lb/hr	Aubert Hall Generator lb/hr	Science and Engineering Center Generator lb/hr
PM*	0.49	0.38	0.38
PM_{10}	0.49	0.38	0.38
SO_2	0.21	0.16	0.16
NO_X	9.08	9.29	9.29
CO	4.16	2.80	2.80
VOC	0.1	0.16	0.16

* Each generator shall be limited to a PM emission limit of 0.12 lb/MMBtu. [ME DEP, Chapter 103]

E. Visible emissions from each emergency generator shall not exceed 20% on a 6 minute block average, except for no more than 2 six minute averages in a 3 hour period. [ME DEP, Chapter 140, BPT]

(47) **Emergency Generator – Alfond Arena**

A. The Alfond Arena 2.0 MMBtu/hr generator shall be limited to 500 hours per year of operation, based on a 12 month rolling total. An hour meter shall be operated and maintained on the emergency generator. [ME DEP, Chapter 140, BPT]

B. The #2 fuel oil shall not exceed a sulfur content of 0.5%. Fuel records shall be maintained including receipts from the supplier documenting sulfur content. [ME DEP, Chapter 140, BPT]

C. A log documenting the dates, times and reason of operation for the emergency generator shall be kept. [ME DEP, Chapter 140, BPT]

D. Emissions from the emergency generator shall not exceed the following [ME DEP, Chapter 140, BPT]:

Pollutant	lb/hr
PM	0.62
PM_{10}	0.62
SO_2	1.0
NOx	8.82
CO	1.9
VOC	0.72

E. Visible emissions from the emergency generator shall not exceed 20% on a 6 minute block average, except for no more than 2 six minute averages in a 3 hour period. [ME DEP, Chapter 140, BPT]

(48) The term of this order shall be concurrent with the term of air emission license A-204-70-A-I.

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF 2003.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____
DAWN R. GALLAGHER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: September 23, 2002
Date of application acceptance: September 23, 2002

Date filed with Board of Environmental Protection:_____

This order prepared by Kathleen E. Molokie, Bureau of Air Quality.